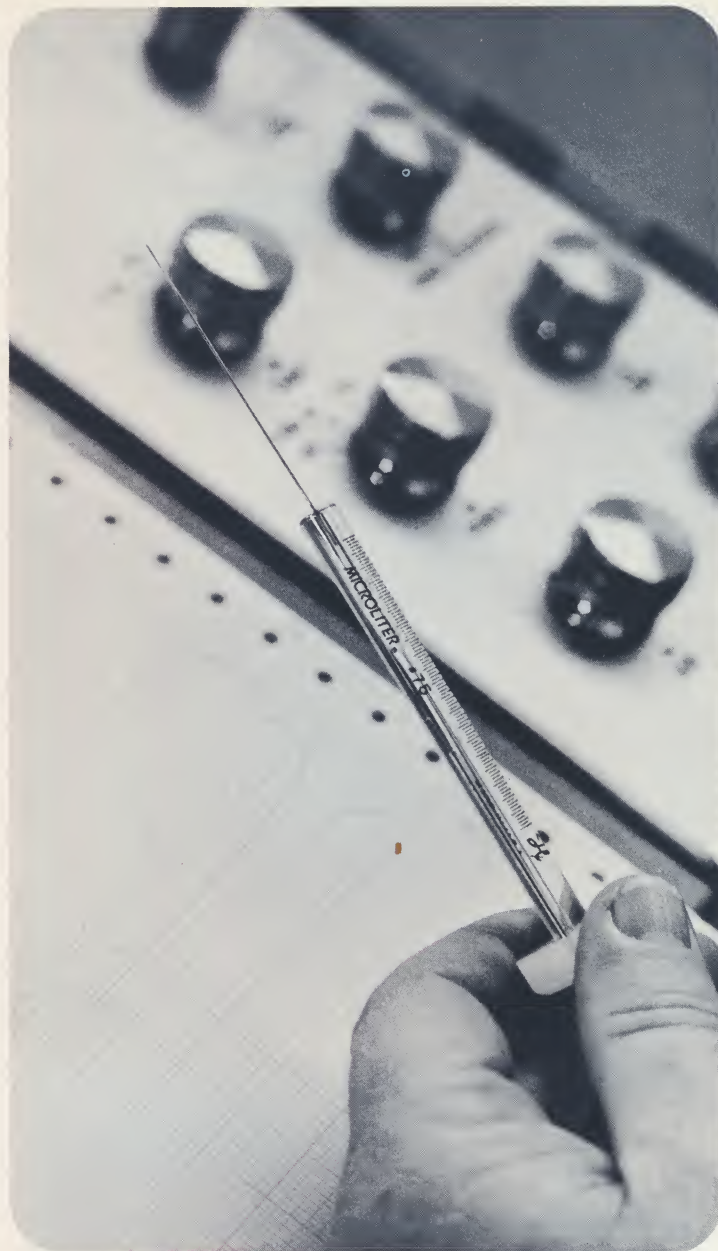




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THE NEEDLE

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NOW YOU CAN SEE IT ALL! Even though previous Hamilton syringes have been capable of handling tiny samples with extreme precision, the new 5 μ l "Microliter 75" is a prime example of how we never "let well enough alone." In line with the

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Hamilton policy of always improving an already excellent product, we have now added the dimension of visual observation to that of mechanical accuracy.

This answer to the analyst's prayer for total visibility of minute liquid samples carries the whole quantity in the glass barrel, where it can be observed and measured in calibrations of 0.5 and 0.1 microliters. It permits injection of samples as small as 0.1 μ l with repeatable accuracy of $\pm 1\%$.

Minimum dead volume is achieved by using a permanently affixed 2-inch needle with 0.0045" bore. Both needle and 0.0135" plunger are highly polished stainless steel, hand-fitted to each syringe. Chemically resistant barrel markings are so sharp that precise readings can be taken with confidence.

Model "75" is available with or without a guide to support the very fine plunger. Designed for injecting small samples into gas chromatographs, it has already proved its versatility in applications pertaining to the chemical, petroleum, medical, electronic and other industries.



LITTLE-KNOWN GUARDIANS OF OUR PRODUCT FRONTIERS

Although the average importer, legal or illegal, may never have heard of a gas chromatograph, his business — even his personal freedom — often hinges on the skillful utilization of precise instruments in the United States Customs Laboratories.

Scientists like Chief Chemist Melvin Lerner of the Customs Lab in Baltimore, Maryland, use them to determine the quality and, sometimes, the origin of questionable or forbidden imports.

According to Mr. Lerner, veteran of 10 years at the Baltimore laboratory and 25 years in the service, a lab project

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may involve almost anything: the purity of olive oil, determination of LSD in a suspected narcotics case, analysis of a shipment of Scotch to verify that it is Scotch and not caramel-colored gin, or proof that a bottle of perfume really contains Chanel No. 5.

Obviously, analytical instruments play important roles. Whether complex electronic metering devices or prosaic syringes, they must share the characteristics of a workhorse. Any instrument whose performance leaves something to be desired can become thoroughly frustrating to a professional chemist trying to concentrate on a ticklish problem.

In the case of Cuban tobacco, currently under what is tantamount to an embargo by the U.S. Government, the lab can not only evaluate whether or not the tobacco was actually grown in Cuba but can even tell if it was grown in this country from Cuban seed!

Since the United States Customs Service has no national research facility, Baltimore finds itself acting more and more in that capacity—performing applied research on tariff and enforcement problems. Much of what is accomplished in Baltimore is being used to establish methods and techniques to be adopted by other Customs Labs around the country. However, Baltimore's work is not restricted to analyzing samples of goods entering our ports. Without question, one of its most important projects concerns analyses of narcotics. Melvin Lerner is an acknowledged leader in the field of narcotics analysis and is, among his other duties, an advisor to the Commission on Narcotic Drugs, United Nations Economic and Social Council. Many of the procedures developed by him to determine the presence of narcotics or LSD in a sample are used by local law enforcement agencies across the country.

In earlier times, questions regarding identity and potency of narcotics arose when the purchased commodity had less than the desired effect. Often enough, the test would be a



Chemist Ralph C. Gilbert injects sample into chromatograph with Hamilton 1005 gas tight syringe.

try-out on a willing addict. The government analyst cannot resort to such a personal test, of course, although some have been known to estimate the strength of a suspected narcotic by its taste.

Being well aware of the difficulties inherent in presenting the results of technical testing to judge and jury, Mr. Lerner and others have turned to qualitative and quantitative gas chromatography for methods leading to conclusive and convincing proof (1).

This is especially important as, lately, the narcotics climate has become more complex. Always in the past, law enforcement officers could easily recognize the marihuana plant. Now, to reduce the incidence of detection, criminals have started adding an extract of the weed to tobacco.

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Today, marihuana can be analyzed rapidly for its major constituents by treating a petroleum ether extract of marihuana with diazomethane and subjecting the resulting mixture to gas chromatography on a polar column (2). Likewise, marihuana extract can be readily detected in tobacco.

Recent work (3) (4) has shown that the physiologically active components in marihuana consist of two isomeric tetrahydrocannabinols. Miss Judith T. Zeffert, a Goucher College senior, and a summer technical aide at the Customs Laboratory, spent this summer in research on the quantitative determination of these tetrahydrocannabinols in marihuana seizures.

In a report to the United Nations (5), Mr. Lerner points out the possibility of determining the origin of heroin through comparison of characteristic impurities. Narcotics agents, he believes, should now be able to determine many factors from a detailed analysis of a heroin sample: whether it was made from pure morphine or from an opium fraction; whether the morphine was fully acetylated in an efficient



Judith T. Zeffert of Goucher College, summer technical aide at the United States Customs Laboratory in Baltimore, Maryland, fills a Hamilton 701 Microliter Syringe with sample.

laboratory or partially acetylated by a chemist in a hurry; whether several middle-men used the same heroin in preparing their diluted products for market; and whether a batch of imported heroin has been widely distributed or confined to one area.

Gas chromatography provides the fastest and most efficient means for such detailed analyses. Both flame ionization and B-ionization instruments are suitable. Basically, the sample is dissolved in a proper solvent and injected into the instrument. Pure fractions of alkaloids are separated for infrared study, making qualitative and quantitative data available within a half hour.

At the U.S. Customs Laboratory in Baltimore, Hamilton syringes are used for their trouble-free, leak-free service and high degree of reproducibility. We are proud of this confidence in our products — because the work of Melvin Lerner and his colleagues sets ever higher standards for other laboratories and law enforcement agencies in their vital war on narcotics peddlers!



- (1) NARCOTICS ANALYSIS—A SIMPLE APPROACH, M. Lerner, A. L. Mills, S. F. Mount, *Journal of Forensic Sciences*, Vol. 8, No. 1, January, 1963.
- (2) MARIHUANA: TETRAHYDROCANNABINOL AND RELATED COMPOUNDS, M. Lerner, *Science*, Vol. 140, No. 3563, April 12, 1963.
- (3) ACTIVE CONSTITUENTS OF HASHISH, E. C. Taylor, K. Lenard, Y. Shvo, *Journal of the American Chemical Society*, Vol. 88, No. 2, January 20, 1966.
- (4) ISOLATION OF TRANS- Δ^6 -TETRAHYDROCANNABINOL FROM MARIJUANA; R. L. Hively, W. A. Mosher, F. W. Hoffman, *Journal of the American Chemical Society*, Vol. 88, No. 8, April 20, 1966.
- (5) SCIENTIFIC RESEARCH ON HEROIN, Commission on Narcotic Drugs, United Nations Economic and Social Council, E/CN.7/476/Add.1, 1 November 1965.